# Teaching Guide to *Shortcuts* by Jeff Harris

## Introduction

*Shortcuts* by Jeff Harris is a beautifully illustrated, fact-packed page that makes learning fun. Each week, *Shortcuts'* multicultural cast (Juanita, K., Roland, Junior and James) offers facts, riddles, jokes and puzzles to help kids learn about science, geography, animals, food, history and holidays.

Each teaching guide provides ideas for expanding the lesson and creating discussion and learning activities for your students. The grade level for the guides is usually 3rd to 4th, but they can be adapted for use at other levels. The guides are broken down into four areas:

**1. Questions for Discussion and Further Study**

Designed to help students think and research, not just give one-word answers

**2. Activity Ideas**

Designed to allow students to be creative and teach themselves

**3. Use the News**

Designed to have students use the news in studying each topic

**4. Quick Quiz**

Designed to be adaptable to several grade levels, evaluate students' comprehension and build vocabulary and math skills

You might use the teaching guides in the following ways:

**Questions for Discussion and Further Study:** Engage the entire class by asking each question aloud and listing the students' answers on the board. Or have them use reference resources to give their own answers to the questions. Allow them to discuss other students' answers after they've researched the topics. Key words or phrases that can help students search for more information are italicized.

**Activity Ideas:** Give the students a time limit to research their projects, using library or study time. By having the students cite their resources you can check their work; or, alternatively, tell them which resource(s) you prefer them to use.

**Use the News:** These can be worked on individually but we suggest they work in groups to learn teamwork skills.

- **Quick Quiz:** We suggest you review the quizzes ahead of time and change the phrasing or difficulty level based on the students' abilities.

# **Shortcuts:** TURNING UP THE HEAT ON SOLAR ENERGY

For release the week of: October 17, 2011

**Objective**: After completing the exercises, students should have a better understanding of solar energy.

**Subject Areas:** The following information about solar energy will be discussed:

- Making a simple solar oven
- Diagramming a rooftop solar water heater
- The value of solar energy

**Evaluation:** Students may be evaluated using the following point scale:

*Four points*: Information is accurate, organized, shows creative thought/use of materials
*Three points*: Information is accurate and organized
*Two points*: Information is mostly accurate; organization needs some work
*One point*: Significant inaccuracies; lacks organization

# Topics for Discussion and Further Study

1. Why does a magnifying glass heat objects under the sun's rays?
2. How does a solar cell make electricity from light?

# Activity Ideas

- Using solar energy can be a simple process. Here is a project your class can do to experiment with solar energy. Make cheese toast or heat a slice of pizza with this homemade solar oven. It's made from a pizza box! http://www.youtube.com/watch?v=xbwliZJiHe8
- How does a rooftop water heater work? Research and draw a diagram of a basic solar water heater. Include a description of how it works.

**Use the News**

- Write an "opinion" article (an editorial) about why you think the use of solar energy is important for us to research and keep improving.

# Answers to the Quiz

1.) b, 2.) d, 3.) a, 4.) c, 5.) a, 6.) b, 7.) solar, 8.) moving, 9.) 602 degrees, 10.) +1 degree C

# Quick Quiz — Solar energy

1. A solar furnace is useful, but can't reach high temperatures.
a. True b. False

2. One of the first solar water heaters was made in _____.
a. China b. France c. Canada d. America

3. Solar concentrators use curved mirrors to collect the sun's rays.
a. True b. False

4. Solar cells change _____ into electricity.
a. sound b. heat c. light d. fire

5. The problem with solar energy is that it is expensive to use effectively.
a. True b. False

6. A _____ portion of the sun's energy reaches Earth every day.
a. large b. small

# Vocabulary Comprehension

7. A photovoltaic cell is also called a _____ cell.

8. Solar cells do not have any _____ parts.

## Math Comprehension (subtraction, division, addition, fractions)

9. What is the difference in temperature between 3,500 degrees C and 2,898 degrees C?

10.If a thermometer read minus 9 degrees C, and then it warmed up 10 degrees, what temperature would it be?